

Fig. 1

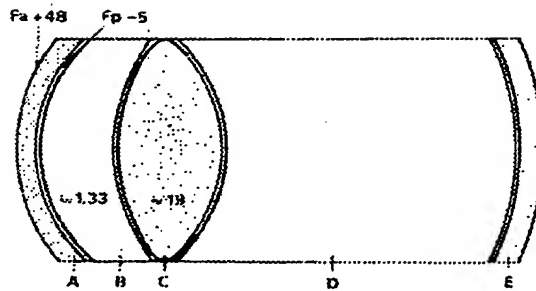


Fig. 2

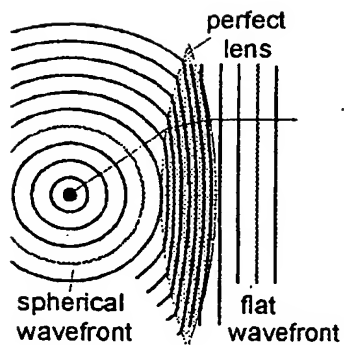


Fig. 3a

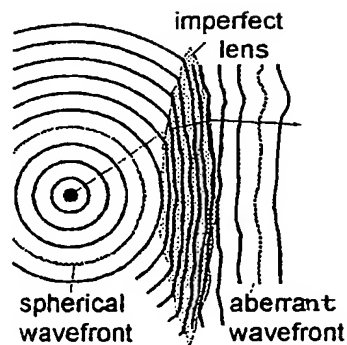


Fig. 3b

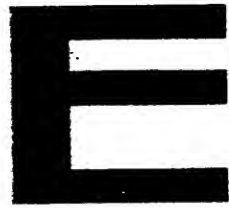


Fig. 4a

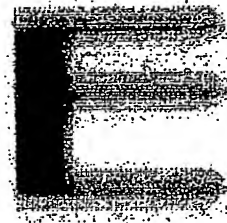


Fig. 4b

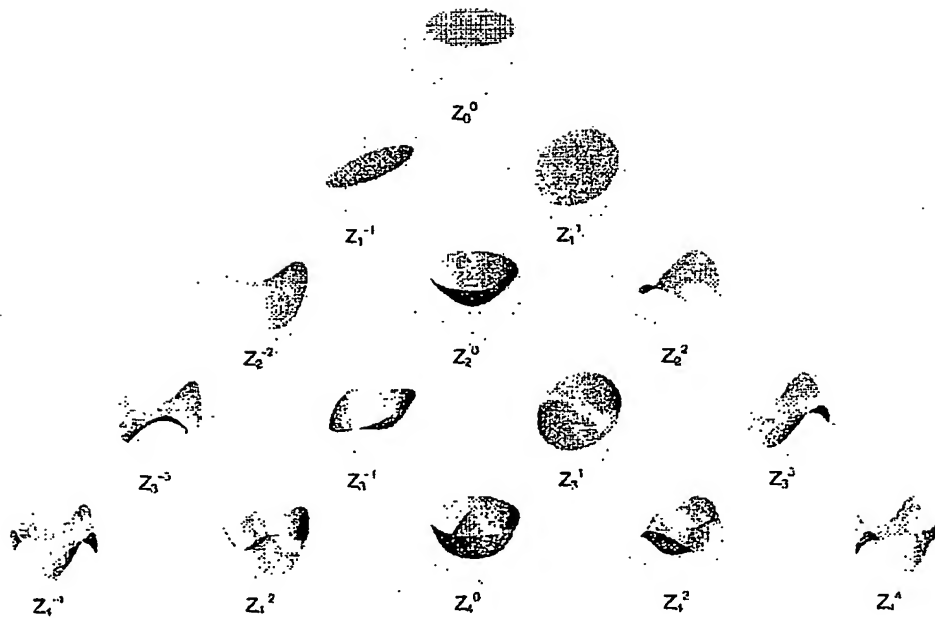


Fig. 5

Term	Order	Polar form	Cartesian form	Description
$Z_0^0$	0	1	1	
$Z_1^{-1}$	1	$\rho \sin \Theta$	X	inclination about the y axis
$Z_1^1$	1	$\rho \cos \Theta$	Y	inclination about the x axis
$Z_2^{-2}$	2	$\rho^2 \sin 2\Theta$	2xy	astigmatism with axis at $\pm \pi/4$
$Z_2^0$	2	$2\rho^2 - 1$	$-1 + 2x^2 + 2y^2$	focus translation
$Z_2^2$	2	$\rho^2 \cos 2\Theta$	$-x^2 + y^2$	astigmatism with axis at 0 or $\pi$
$Z_3^{-3}$	3	$\rho^3 \sin 3\Theta$	$-x^3 + 3xy^2$	triangular astigmatism with base on the x axis
$Z_3^{-1}$	3	$(3\rho^3 - 2\rho) \sin \Theta$	$-2x + 3x^3 + 3xy^2$	third order coma along the x axis
$Z_3^1$	3	$(3\rho^3 - 2\rho) \cos \Theta$	$-2y + 3x^2y + 3y^3$	third order coma along the x axis
$Z_3^3$	3	$\rho^3 \cos 3\Theta$	$-3x^2y + y^3$	triangular astigmatism with base on the y axis
$Z_4^{-4}$	4	$\rho^4 \sin 4\Theta$	$-4x^3y + 4xy^3$	
$Z_4^{-2}$	4	$(4\rho^4 - 3\rho^2) \sin 2\Theta$	$6xy + 8x^3y + 8xy^3$	
$Z_4^0$	4	$6\rho^4 - 6\rho^2 + 1$	$1 - 6x^2 - 6y^2 + 6x^4 + 12x^2y^2 + 6y^4$	spherical aberration
$Z_4^2$	4	$(4\rho^4 - 3\rho^2) \cos 2\Theta$	$3x^2 - 3y^2 - 4x^4 + 4y^4$	
$Z_4^4$	4	$\rho^4 \cos 4\Theta$	$x^4 - 6x^2y^2 + y^4$	

Fig. 6



Fig. 7

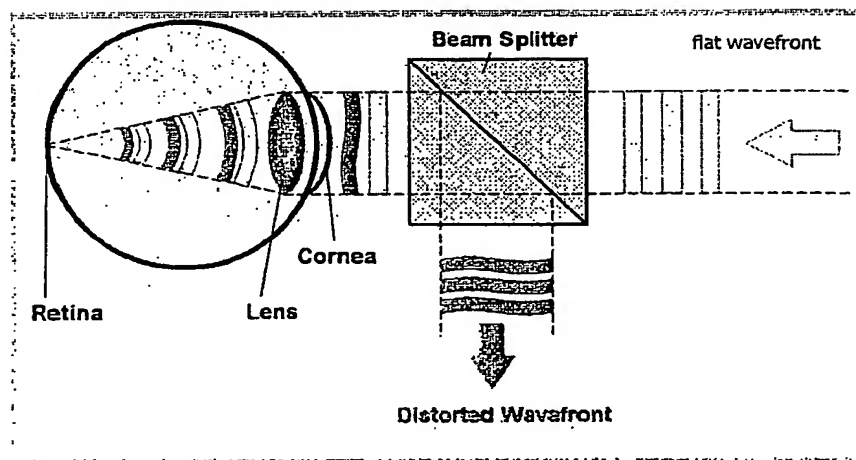


Fig. 8

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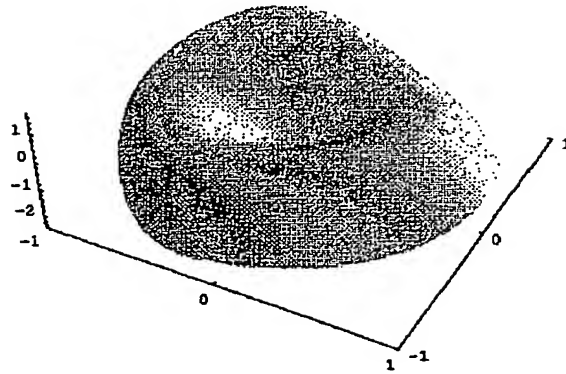


Fig. 9

	II order	III order	IV order
			$Z_4^{-4}$ : -0.188
		$Z_3^{-3}$ : -0.185	
	$Z_2^{-2}$ : -0.722		$Z_4^{-2}$ : -0.112
		$Z_3^{-1}$ : -0.746	
	$Z_2^0$ : -0.079		$Z_4^0$ : -0.873
		$Z_3^1$ : -0.466	
	$Z_2^2$ : -0.254		$Z_4^2$ : -0.093
		$Z_3^3$ : -0.035	
			$Z_4^4$ : 0.105

Fig. 10

7

quantity		value
1	sphere	X -0.30 d
	cylinder	X -0.50 d
	axis	8°
2	pupil diameter	3.59 mm
3	analysis diam	3.59 mm
4	Z(3,-3)	0.061 $\mu$ m
	Z(3,-1)	-0.143 $\mu$ m
	Z(3,1)	-0.096 $\mu$ m
	Z(3,3)	-0.059 $\mu$ m
	Z(4,-4)	0.047 $\mu$ m
	Z(4,-2)	0.007 $\mu$ m
	Z(4,0)	-0.048 $\mu$ m
	Z(4,2)	-0.017 $\mu$ m
5	Z(4,4)	0.002 $\mu$ m
	PV OPD	2.08 $\mu$ m
	RMS OPD	0.45 $\mu$ m
	PV OPD HO	0.41 $\mu$ m
6	RMS OPD HC	0.07 $\mu$ m
	x offset	-0.53 mm
	y offset	-0.83 mm

Fig. 11

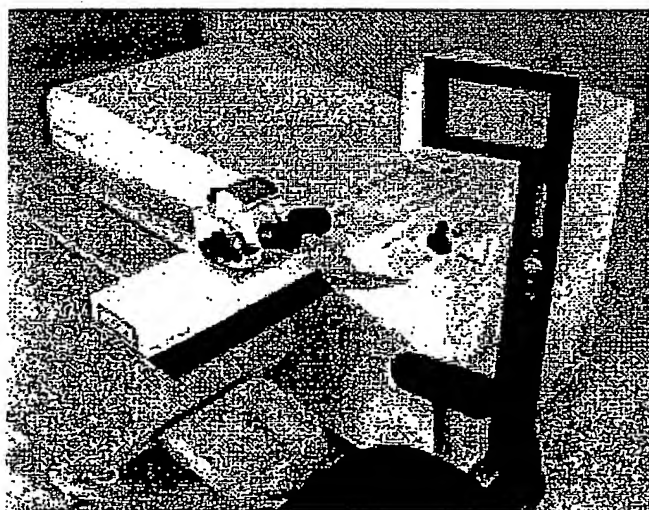


Fig. 12

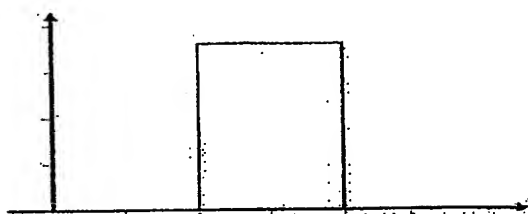


Fig. 13a

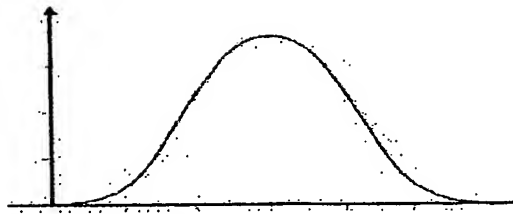


Fig. 13b

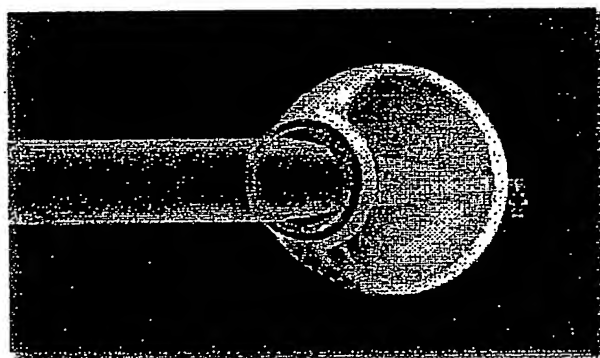


Fig. 14

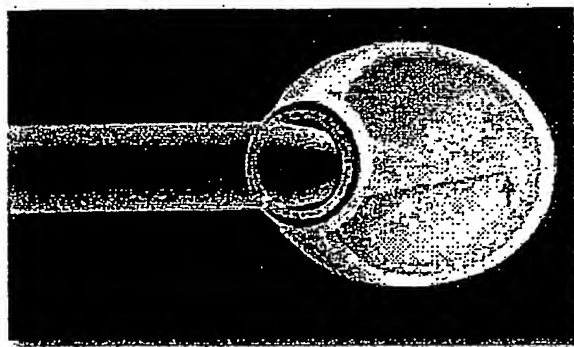


Fig. 15

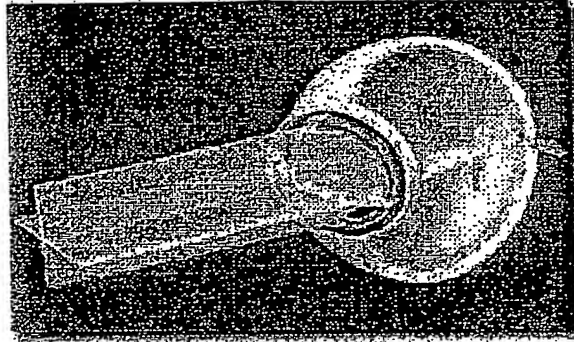


Fig. 16

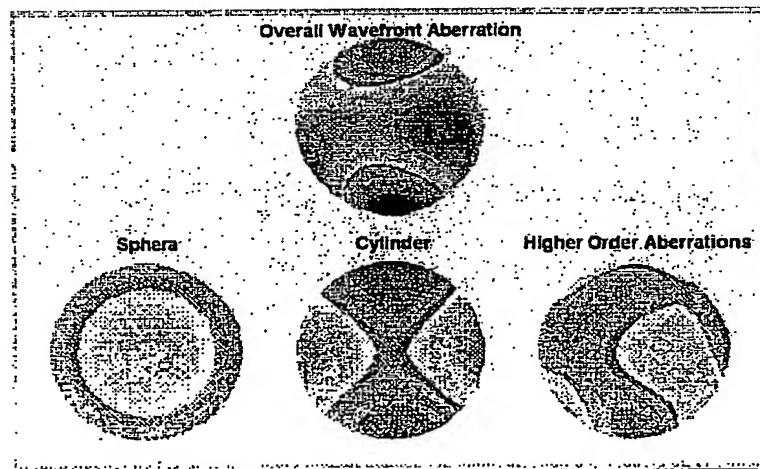


Fig. 17



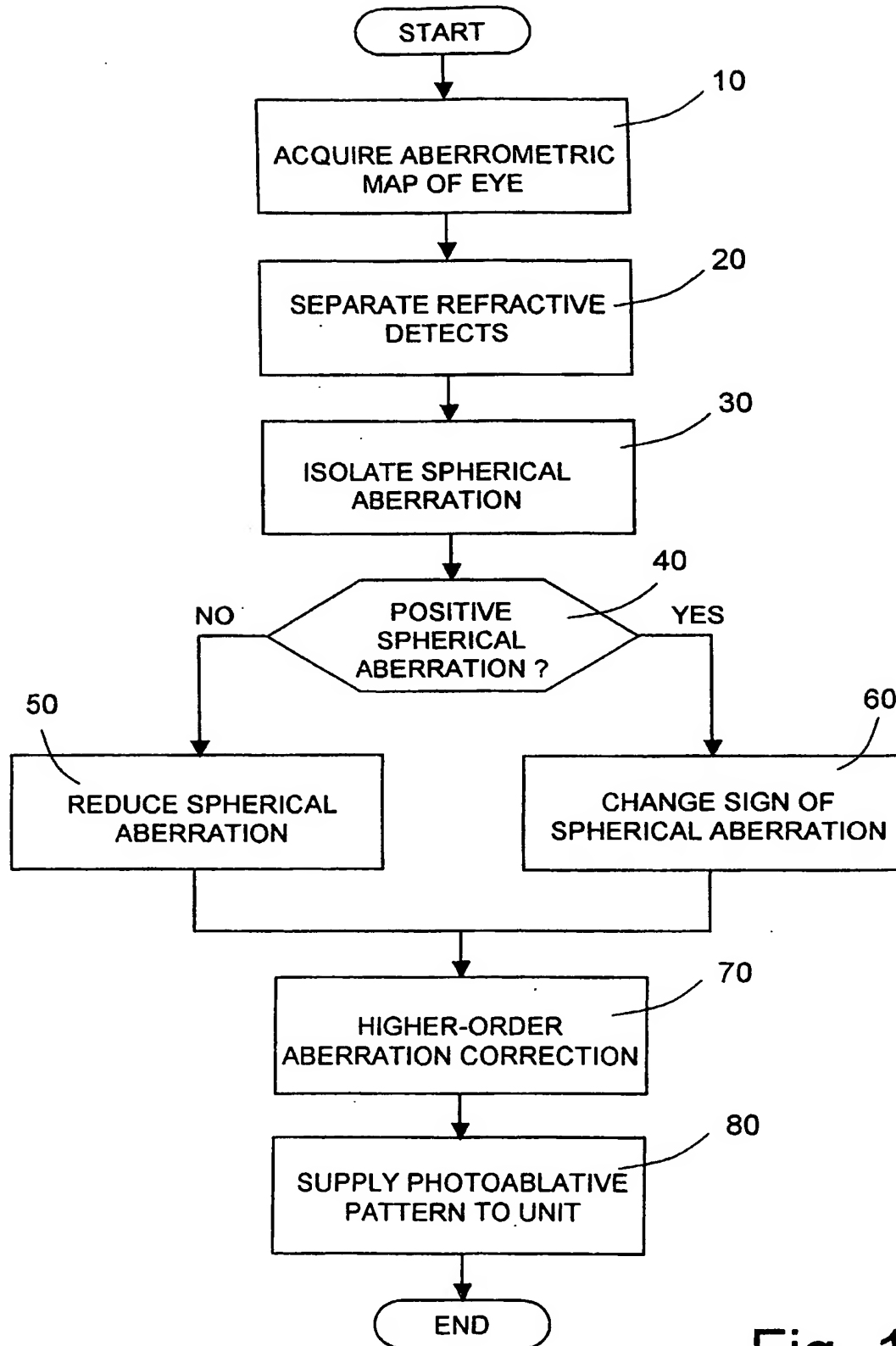


Fig. 18

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